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ABSTRACT

This study was conducted to: (1) determine if the intercession calendar, an alternative calendar that reduces the total school year for students who do not need remediation, positively impacts overall student achievement; (2) to assess the explanatory ability of the intercession model in accounting for student academic achievement variability; and (3) to determine the variables which differentiate among the treatment group using discriminate analysis. The intercession calendar was not a year-round calendar. Instead, it reduced the school year from 180 to 170 days for students of average achievement and above, with a one-week session between the grading periods for students in need of remediation. Results for 4,474 students in 10 school districts show that the intercession calendar had a positive impact on student academic achievement in general and on reading in particular. In addition, the intercession calendar had a positive effect on economically disadvantaged students passing all Texas Assessment of Academic Skills (TAAS) examinations simultaneously. The results of this study call into question a number of assumptions regarding long-held traditions of public education. Some limitations of the research are noted, and suggestions are made for further research. This alternative calendar is a systematic reform model that provides individualized assistance to each student within the school district. The intercession calendar is attached. (Contains 2 tables and 14 references.) (Author/SLD)

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Student Achievement: Is Equality Really Necessary?

Presented at the American Educational Research Association's Annual Conference

April 13th, 2001

Seattle, Washington

By

Jimmy K. Byrd

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ABSTRACT

The purposes of this study were (a) to determine if the intercession calendar, an alternative calendar that reduces the total school year for all, positively impacts overall student achievement, (b) to assess the explanatory ability of the intercession model in accounting for student academic achievement variability, and (c) to determine which variables significantly differentiate among the treatment group using discriminate analysis. Results revealed that the intercession calendar positively impacted student academic achievement in general and reading in particular. In addition, the intercession calendar had a positive impact on economically disadvantaged students passing all Texas Assessment of Academic Skills (TAAS) exams simultaneously. This criterion-referenced exam is administered to all regular education students in grades 3-8 and 10 in reading, mathematics, and writing.

The results of this study call into question a number of assumptions regarding long held traditions of public education. Limitations of the research were noted and suggestions for further research were made. Educators, Legislators, and the public should consider this alternative calendar as a systematic reform model that provides individualized assistance to each student with-in the school district.

Student Achievement: Is Equality Really Necessary?

By Jimmy K. Byrd

Introduction

In the current era of educational reform, traditional educational values are under scrutiny and the push for accountability, as measured by student performance, is increasing. Public school districts are incessantly searching for meaningful reform models that will provide positive, long lasting, systematic consequences for all students. Five public school districts in Texas have countered by developing an alternative reform model that appeals to the unique needs of each individual student. This concept, known as an intercession calendar, actually reduces the school year from the traditional 180 days to 170 days for all students, while providing extended time for only those students in need of remediation (See Appendix -1). Interestingly, this *is not* year-round education. School begins in mid August and ends in May for all students, following the same time frame as the traditional agrarian calendar.

The question is whether or not this is a viable reform model that can meet the public's demands of providing individualized education for each student while increasing omnibus student achievement.

In a recent survey conducted by Phi Delta Kappa, 2000, it was found that only 20 percent of the nation's public give today's education system an "A" or "B". In this same poll, 41 percent of the parents surveyed were convinced that their children are receiving a better education than they themselves had received. As for teachers, only 24 percent of the nation's educators surveyed give today's public education system an "A" or "B"

(Langdon, 1999). In contrast, when the public was posed the question, "If given the choice between reforming the current public education system or finding an alternative solution, which would you choose?" Almost 60 percent of the nation's public favored reforming the current public education system over finding an alternative system (Gallup, 2000). It is evident from this survey that public interest in and expectations for the current education system are extreme. However, the greatest challenge now facing educators is to prove to the nation's public that the educational establishment can respond to these pressures in a positive way.

The first wave of school reform efforts was initiated by the 1983 report entitled *A Nation at Risk*. As we enter into the second wave, many of the districts throughout the United States are searching for systematic solutions to counter the public's demands. With the metaphorical "smorgasbord" of reform ideas available, many schools find it difficult to obtain a systematic solution by choosing a "small portion of this" and a "large portion of that" in order to meet the dynamic needs of *all* students in each unique public school district. What is needed is *district-wide* change that positively benefits each student.

One district-wide obstacle that is in need of revision is the traditional time pattern that is prevalent among the majority of public school districts throughout the country. Dlugosh, (1994) asserts that students in public schools spend an average of 178 days in class by following the traditional pattern of the agrarian calendar that has been in place for more than 75 plus years. Even though spending 178 days in public school is the accepted practice, no significant reform has occurred. There are several studies asserting that extended time in the classroom has had significant effects on improved student

achievement and many districts are using the research as evidenced by the number of school systems employing some form of year-round education model.

According to Ballinger, 1998, an increasing number of public school systems are altering their school calendar by lengthening their school year to include more days than the traditional 180-day agrarian calendar espouses. The increase in school districts restructuring their school calendar is phenomenal as evidenced by 63 districts in 1985-86 utilizing some form of Year Round Education calendar to 651 districts in 2000-2001. This was an increase of approximately 930 percent in a fifteen-year period, with the state of California leading the nation (NAYRE, 2001). Recent reports reveal that many Texas schools who bought into the idea in 1990, have now returned to the traditional calendar for various reasons. (Texas Education Agency, 2001)

Much has been written regarding increased time in the school year and its impact on student achievement. Indeed, a growing body of research indicates that altering the school calendar by providing extended time beyond the 180 day traditional, agrarian calendar positively impacts student achievement (Frazier, Delong, & Jones, 2000;Davies & Kerry, 1999; Reville, 1999; Ballinger, 1998; et al;). The most common premise cited for this move is that not all children learn at equal rates. The 1994 report from the National Commission on Time and Learning conveys the following:

"...our time-bound mentality has fooled us into believing that schools can educate all the people all of the time in a school year of 180 six hour days...Providing equal time for students who need more time guarantees unequal results" (Reville, 1999).

Davies and Kerry, (1999) agree and concluded that year round education and other school calendar reforms may have distinct advantages over the outmoded agrarian

calendar by providing extended time to all students. They further concluded that school calendar reform leads to increased academic achievement and includes benefits such as: a decrease in stress for both students and teachers, increased motivation, potential for improved planning, and target setting for both teachers and students. These findings were further accentuated in a study of the Socorro Independent School District in Texas. Shook, 1998, found that improved instructional continuity and improved mental health result from less stress to teachers and students on the year round calendar.

In contrast, a report by the University of Minnesota, 1998, examined 75 studies and found that " research on student achievement indicates students attending year-round schools will perform as well as, and in some instances better than students attending school on a traditional calendar." It was further concluded that there is no one alternative calendar that exceeds others in allowing districts to meet the educational needs of their individual students.

In spite of the myriad of studies espousing how increased time in the school year affects student achievement, relatively few studies have emphasized shortening the school year or providing less time in the classroom for all students while providing more intense instruction for only those students in need. Although Frazier, 1998 found that extending the school year from 180 days to 210 days while requiring students to work *shorter days* (the same amount of teaching taking place as in 180 days) had a positive impact on reading achievement for grades K and 1. She further concluded "the extended year [with shorter days] is more effective in raising achievement than is a period of revision and review in the autumn term." However, the literature is superficial in terms of reducing the school year for those students who will master the content regardless of the

time spent in class while increasing the amount of time for those students who truly have difficulty in comprehending the essential components of the required courses.

In Texas, several public school district leaders recognized that not all students learn at equal rates. To counter this assumption, they altered the school calendar to meet the needs of each individual student. In their quest to provide individual academic remediation to individual students'- in- need, they reduced the school calendar by ten days for all students, while providing extended time to only those students identified in need of further remediation. This unique approach, known as an intercession calendar, provides 170 days of instruction for *all* students while providing up to 196 days to those students in need of further academic assistance. Interestingly, this model *is not* year-round education. School begins in mid August and ends in May for all students, following the same time frame as the traditional agrarian calendar (9 months).

The basic premise underlying this novel concept is that the knowledge gap is minimal each six-weeks, and the student in need of assistance does not have to wait until summer school to obtain assistance to pass. In other words, if a student is failing in September, he/she receives intense assistance in September. When the next reporting period begins, the gap has been narrowed and the student should have a basic understanding of the concepts he/she was having difficulty with during the previous six-weeks.

In contrast, the agrarian model allows students who have failed a reporting period to proceed to the next six weeks often with little assistance provided. If the student continues to experience difficulty, he/she must seek alternative routes to makeup the course work. It is then up to the student to receive a full year of education in a shortened

period of time, generally in the form of six weeks, or less, during the summer to attain credit for the course.

There may be some reservation among scholars regarding the concept of reducing the school year; however, an attempt to understand the effects of an intercession calendar, combined with providing extra time for only those students in need of further remediation, can be used as a basis for further research in policy issues. In view of the public's demands for increased accountability and their lack of trust in the public school system today (Phi Delta Kappa, 2000), it becomes imperative to monitor recent trends that may effect future policy. This study examines the effects of an intercession calendar on student achievement in reading, mathematics, and writing on the Texas Assessment of Academic Skills exam.

Purpose

The purposes of this study were (a) to determine if the intercession calendar positively impacts overall student achievement, (b) to assess the explanatory ability of the intercession model in accounting for student academic achievement variability, and (c) to determine which variables significantly differentiate among the treatment group using discriminate analysis.

Limitations

1. Only five districts in Texas utilize this particular model.
2. Districts that utilize this calendar have an average enrollment of approximately 450 students.

Methodology

Participants

This study involved 4,475 students in ten public school districts throughout the state of Texas. Five of these districts were identified by the Texas Education Agency as receiving a state-approved waiver to utilize an intercession calendar, while five districts were randomly selected, based on demographics, to serve as a control group. A three-year comparative study, at the district level, was performed using the 1996-97, 1997-98 and 1998-99 Texas Academic Indicator Excellence System (AEIS) data to determine if the "Intercession" calendar significantly impacts student achievement.

Districts utilizing the intercession calendar require *all* students to attend school for a period of five weeks of each six-week reporting period, while *only* the students identified in need of extra-academic assistance are brought back during the ensuing week to receive individualized attention. The students who are passing all required subjects can utilize the sixth week to attend district provided enrichment activities that consist of technology based activities, reading activities, and field trips or they can use the week to schedule medical appointments, attend to personal matters or take family vacations.

These districts, which have a total average student enrollment of approximately 450 students, are located throughout the state of Texas in rural areas with approximately half of the student enrollment identified as low-income, which is based on qualifying for the Free and Reduced Meals (FARM) program. The student body of each of these districts is culturally diverse with approximately 60 percent of the student body identified as white, 36 percent Hispanic and 4 percent African-American. It is noted that among the sample studied, district size varied from 158 students to 994 students. This required the researcher to control for district size by entering this variable as a covariant in the

analysis. No significant differences were detected among percent low income, cultural makeup, teacher student ratio, percent teacher turnover, and attendance rate, thus allowing the school calendar to be examined in isolation. Table 1.0 further exhibits no significant demographic differences between the sample of districts utilizing an intercession calendar and those maintaining the traditional calendar.

Table 1.0- Test of Significant Differences Among Selected Demographic Variables in Districts Utilizing a Traditional Calendar and Intercession Calendar.

Variable		Intercession Calendar Districts with 170 day calendar n=5 Total Students = 2,215	Traditional Calendar Districts with 180 day calendar n=5 Total Students = 2,260	Test of Significant Difference
District Size				
District--1		158	159	
District--2		215	186	
District--3		420	425	
District--4		474	497	
District--5		946	994	
District Size	*M*	443	452	$t(8) = .045$
	SD	311.33	336.57	p=.964
Percent Low Income	*M*	49.98	54.08	$t(8) = .544$
	SD	17.03	6.87	p=.694
Ethnicity/Cultural				
Percent White	*M*	65.90	58.16	$\chi^2(2) = 10.00$
	SD	16.23	29.30	p=.350
Percent Hispanic	*M*	36.25	37.37	
	SD	23.39	25.59	
Percent African Ame	*M*	5.22	3.171	
	SD	6.72	5.40	
District Variables				
Teacher Turnover	*M*	17.20	20.56	$t(8) = .764$
	SD	8.46	4.50	p=.466
Teacher /Student Ratio	*M*	11.50	12.04	$t(8) = .949$
	SD	1.64	1.60	p=.944
% Attendance (1998)	M	95.68	95.46	$t(8) = .548$
	SD	.5070	.7403	p=.598

* Significant at $p < .05$
** Significant at $p < .01$

Dependent variable

The dependent variables examined across both the traditional and intercession calendar includes; total percentage of students passing all Texas Assessment of Academic Skills (TAAS) tests, percent of economically disadvantaged students passing all TAAS tests, and the percent of all students passing TAAS reading, writing, and math.

The TAAS tests were chosen as the dependent variable since all regular education students in Texas must take the TAAS in grades 3-8 and 10. The primary evidence for the validity of the TAAS tests lie in the content being measured. Since the tests assess the Texas state-mandated curriculum, which is required to be taught to all students, the tests are not more or less valid for use with one sub-population over another sub-population. In other words, because the TAAS and end -of-course tests are measuring what is required to be taught to all students, and are given under the same standardized conditions to all students, the tests have the same validity for all, (Technical Digest, 2000).

The standard for passing (or meeting minimum expectations on) the exit-level TAAS test is equivalent to correctly answering 70% of the items based on the October 1990 exit-level test. In the spring of 1994 the passing standards in reading and mathematics at grades 3-8 were aligned with the exit-level standard in order to measure student achievement across time. Students in grades 3-8 and 10 achieving a Texas Learning Index (TLI) score of 70 or higher meet minimum expectations in reading and mathematics. On the writing test, students must achieve a scale score of 1500 or higher to meet minimum expectations. (Source: TEA Division of Student Assessment). The dependent variable is further defined in table 2.0.

Table 2.0 Definition of Dependent Variable

Variable	Definition	Student Achievement Indicators
Student Achievement	Defined as percentage of students scoring 70% on the Texas Learning Index on each of the student achievement indicators. Measured by the percent of students passing all TAAS tests as indicated by scoring at or above 70% on the TLI.	♦ **Percent Passing All TAAS Tests** The total number of students who passed all the TAAS tests they attempted expressed as a percentage of the total number of students who took one or more tests. The performance of students tested in grades 3-8 and 10 in reading and mathematics, and grades 4,8, and 10 in writing are included. TAAS science and social studies results are not included. Special education students and their scores have been excluded. Only students enrolled in the district as of October, 1997 are included. (Source: TAAS) ♦ **Percent Passing Math TAAS Tests** The total number of students who passed TAAS math tests they attempted expressed as a percentage of the total number of students who took the math test. The performance of students tested in grades 3-8 and 10 in mathematics are included. ♦ **Percent Passing Reading TAAS Tests** The total number of students who passed TAAS reading tests they attempted expressed as a percentage of the total number of students who took the reading test. The performance of students tested in grades 3-8 and 10 in reading are included. ♦ **Percent Passing Writing TAAS Tests** The total number of students who passed TAAS writing tests they attempted expressed as a percentage of the total number of students who took the writing test. The performance of students tested in grades 4, 8 and 10 in writing are included. ♦ **Percent Economically Disadvantaged Students Passing All TAAS Tests** The total number of economically disadvantaged students who passed all the TAAS tests they attempted expressed as a percentage of the total number of students who took one or more tests. The performance of students tested in grades 3-8 and 10 in reading and mathematics, and grades 4,8, and 10 in writing are included. TAAS science and social studies results are not included. Special education students and their scores have been excluded. Only students enrolled in the district as of October, 1997 are included. (Source: TAAS)

Independent Variable

School calendar

The school calendars examined in this study include both a traditional calendar and an intercession calendar. The traditional calendar, commonly know as an Agrarian calendar, is based on all students attending school for a period of 180 days. The grade-reporting period of the districts in the present study is based on a six-week reporting period. This particular design has been in existence for over 75 years and is the prevalent model utilized throughout the nation (Dlugosh, 1994).

The intercession calendar is a unique model that requires all students to attend school for a period of 170 days, ten days less than the traditional calendar discussed above. The grade-reporting period of the districts in the present study is also based on a six-week

reporting period with all students attending the first five weeks of the grade-reporting period. During the ensuing week, students who are failing a class or who have not passed some portion of the TAAS test and/or scored below the 40 percentile on the reading portion of the Iowa Test of Basic Skills (ITBS) exam are brought back for focused, individualized assistance. The remainder of the students who are passing subjects and have passed all TAAS test and ITBS exams can use the week for enrichment activities such as field trips, research their topic of interest or they may take the week off to spend with their family.

Procedure

Treatment

The calendar variable was recoded as follows:

Traditional calendar = 1

Intercession calendar = 2

The purpose of the recoding was to compare scores on the dependent variables among districts using an intercession calendar to those utilizing a traditional calendar.

The correlation matrix in table 4.0 suggests the presence of a confounding latent variable across each indicator of student achievement, which implies that the five indicators of student achievement are sharing some portion of the latent variable's effect on student achievement. Because the 5 indicators of student achievement are inter-correlated, the researcher used multivariate analysis of variance (MANOVA) to account for the relationship among the multiple dependent variables and control for the noted intercorrelation. Independent variables in the present study include both the intercession and traditional calendars (See table 3.0).

Table 3.0 Pearson Product Moment Correlations Among the Dependent Variables.

	All TAAS	Eco Disadv All TAAS	TAAS Reading	TAAS Writing	TAAS Math
All TAAS	1.00				
Eco ALL TAAS	.901**	1.00			
TAAS Reading	.943**	.923**	1.00		
TAAS Writing	.773**	.726*	.681*	1.00	
TAAS Math	.872**	.897**	.928**	.663**	1.00

*p<.05 . **p<.01

Data Analysis

MANOVA analyses were calculated using Statistical Package for Social Science, a statistical package commonly used in the social sciences, with results presented in table 4.0. In addition to statistical significance (i.e. p levels), the researcher calculated the effect size (canonical correlation) and statistical power for each interaction and pertinent main effect. It is noted that district size was controlled for in the data analysis due to the variability noted in table 1.0 (SD = ~311.0). Based on the interpretation of these statistics, statistically significant MANOVA results were analyzed using descriptive discriminant analysis (Brays and Maxwell, 1985).

Table 4.0 indicates a significant relationship among the calendar variables as a main effect in the treatment group $F(5, 4)= 6.86$, $p<.05$, $R^2= .896$, but fails to identify any significant relation between years when entered as a main effect. Interactions that included both the year and the calendar effect were not statistically significant.

Table 4.0-Results of MANOVA analysis investigating effects of Calendar, Year, and Calendar by Year interaction comparing districts utilizing a intercession calendar and districts utilizing a traditional calendar.

Effect	Wilk's λ	F	P	CC	R-Squared	²Obs. Power
Calendar	.104	6.86[1]	.043	.910	.896	.681
Year	.294	1.10	.485	.530	.458	.298
Calendar X Year	.712	.486	.777		.288	.108

[1]For F Tests, hypothetical df=5 and error df =4.
²Power of F test at α = .05.

The resulting discriminant analysis reveals that the dependent variable, student achievement, differentiated significantly among the intercession and traditional calendars, Wilk's lambda = .172, Chi^2 (2, N= 10) = 12.304, p = .002, CC = .910. It is further noted that students identified as passing TAAS reading were most responsible for the significant differentiation among calendars as noted by the F-to-remove statistic F (1,8) = 13.508, $p<.01$ and the means portrayed in table 5.0.

In further analysis of the dependent variable, the researcher examined the effect of the intercession calendar on each of the five indicators of student achievement. The findings indicate that the intercession calendar, when entered as a main factor, is responsible for 58.2 percent of the variation among students passing both the reading and math portions of the TAAS exam. In addition, the intercession calendar accounted for approximately 41 percent of the variation among economically disadvantaged students passing all TAAS exams simultaneously (reading, writing, and math). See table 5.0

Table 5.0 – Test of Significant Differences Among Student Achievement Indicators in Districts Utilizing an Intercession Calendar verses a Traditional Calendar.

Student Achievement Indicator		Traditional Calendar	Intercession Calendar	Test of Significant Difference	Adjusted R-Squared
Percent Passing All-TAAS	M	70.14	82.80	t(8) =2.11	.278
	SD	5.39	7.82	p = .068	
Percent Passing All-Reading	M	78.44	90.50	t (8) = 3.67**	.582
	SD	5.22	4.52	p = .006	
Percent Passing All- Math	M	78.14	93.10	t(8) = 3.30**	.524
	SD	9.59	3.29	p = .003	
Percent Passing Writing	M	82.54	89.68	t (8) = 1.721	.179
	SD	7.62	5.28	p = .124	
Percent Eco.Disadv Passing All- TAAS	M	60.08	78.04	t (8) = 2.76*	.419
	SD	13.16	5.5	p = .026	

*p < .05, **p< .01

Discussion

From the outset, the researcher's purpose was three-fold, which included: (a) to determine if the intercession calendar positively impacts overall student achievement, (b) to assess the explanatory ability of the intercession model in accounting for student academic achievement variability, and (c) to determine which variables significantly differentiate among the treatment group using discriminate analysis.

The results from the present study suggest that the intercession calendar is a promising instrument to improve student achievement as measured by the indicators discussed earlier, Canonical Correlation = .910, p<.05. When considering the effect of the intercession calendar on the individual indicators, table 5.0 indicates the intercession calendar explained approximately 58.2 percent of the variation among students passing the reading portion of the TAAS exam and approximately 53 percent of the variation

among students passing the TAAS math exam. As for students identified as economically disadvantaged, the intercession calendar is a promising instrument to assist this important subgroup in passing all TAAS exams simultaneously (Adj.R^2=.419).

When employing discriminant analysis to further explore the significant calendar effect, the researcher used Bray and Maxwell's, 1985, recommendations and employed the F -to-remove statistic. These findings indicate students' passing the reading portion of the TAAS exam were most responsible for the significant differentiation among the traditional and intercession calendar in the treatment groups.

Conclusion

The importance of altering time spent in school by lengthening the school year has been suggested in previous research. However, this study contributes to the literature in that research on shortening the school year for all, while providing assistance for individual learners in the context of an agrarian calendar, remains scant.

The findings from the present study indicate that the intercession calendar does, indeed, positively impact student academic achievement. The implications of these findings are significant for policy makers, educational leaders and school boards who demand that the needs of each individual student be met. With Texas educators responsible for educating 3.9 million students, and approximately half identified as economically disadvantaged, according to the FARM criteria (Texas Education Agency, 2000), it is imperative that school leaders look to programs such as the intercession calendar as a possible systematic reform strategy.

Although, there may be those who are skeptical about reducing the school year, Goodlad, 1984, sums it rather nicely when he suggests,

> "If our interest is in quality educational experiences, we must stop providing only time. I would always choose fewer hours well used over more hours engaged in sterile activities. Increasing the days and hours in school settings will in fact be counterproductive unless there is a simultaneously marked improvement in how time is used" (Pg. 283).

We must adhere to these words if we are to expect meaningful, systematic reform that positively impacts each individual student.

Further Research

With the findings indicating a relation between the intercession calendar and student achievement, at the district level, it is recommended that further analysis be carried out at the individual student level.

Further study should also investigate the intercession calendar in the context of a larger culturally diverse metropolitan area. The utilization of this plan has, thus far, been limited to five relatively small districts throughout Texas. Variables that warrant further investigation into the effectiveness of the intercession calendar include; district wealth, college admission exams, other norm-referenced exams that measure similar skills as the TAAS exam (such as the Iowa Test of Basic Skill) as well as the five indicators examined in the present study.

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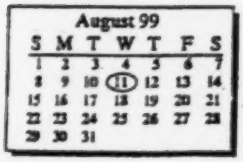
Appendix -1

Intercession Calendar

1999-2000 School Calendar



August

11 First Day of School

September

6 Labor Day Holiday

20 Intercession

21 Intercession

22 Intercession

23 Intercession

24 Intercession

November

1 Intercession

2 Intercession

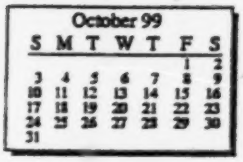
3 Intercession

4 Intercession

5 Intercession

25 Thanksgiving Holiday

26 Thanksgiving Holiday



December

17 End of First Semester

20 Intercession

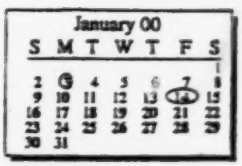
21 Intercession

22 Intercession

January

3 Return from Christmas Break

14 Teacher Workday



February

14 Intercession

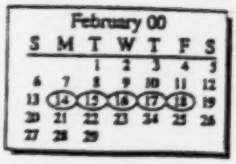
15 Intercession

February

16 Intercession

17 Intercession

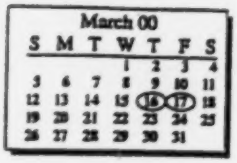
18 Intercession



March

16 Spring Break–Snow Day

17 Spring Holiday



April

3 Intercession

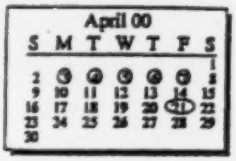
4 Intercession

5 Intercession

6 Intercession

7 Intercession

21 Good Friday Holiday

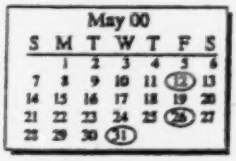


May

12 Snow Day

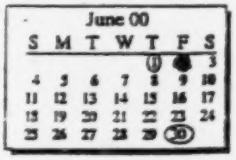
26 Last Day School & Graduation

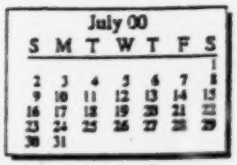
31 Intercession



June

1 Intercession
Summer School Begins





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